

Colorado Journeyman Practice Exam (Sample)

Study Guide



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SAMPLE

Questions

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- 1. According to NEC code, how many receptacles are allowed in a kitchen area for small appliances?**
 - A. Two receptacles**
 - B. Three receptacles**
 - C. Four receptacles**
 - D. Five receptacles**
- 2. What is the minimum height for a service drop above a residential driveway?**
 - A. 10 feet**
 - B. 12 feet**
 - C. 14 feet**
 - D. 8 feet**
- 3. What is the function of a ground fault circuit interrupter (GFCI)?**
 - A. To switch circuits on and off**
 - B. To prevent electrical fires**
 - C. To cut power when it detects a fault**
 - D. To monitor electrical load**
- 4. How often is the National Electrical Code updated?**
 - A. Every two years**
 - B. Every three years**
 - C. Every four years**
 - D. Every five years**
- 5. What is the minimum size copper wire allowed for residential branch circuits in Colorado?**
 - A. 16 AWG**
 - B. 12 AWG**
 - C. 14 AWG**
 - D. 10 AWG**

- 6. What is the purpose of using multi-wire branch circuits?**
- A. To reduce installation costs**
 - B. To allow for a single circuit to supply multiple voltages**
 - C. To provide flexibility for future expansions**
 - D. To distribute power more evenly across circuits**
- 7. What is the definition of a "lighting outlet" in NEC terms?**
- A. An outlet intended for electrical appliances**
 - B. An outlet intended for the direct connection of a lighting fixture**
 - C. An outlet used for outdoor lighting**
 - D. An outlet reserved for emergency lighting**
- 8. What does the term "ampacity" refer to?**
- A. The total electrical energy consumed**
 - B. The maximum amount of electric current a conductor or device can carry before sustaining immediate or progressive deterioration**
 - C. The resistance of a conductor**
 - D. The voltage level in an electrical circuit**
- 9. What kind of protection is required between conductors and armor in armored cable?**
- A. Heat-shrink tubing**
 - B. Insulating bushing**
 - C. Electrical tape**
 - D. Plastic conduit**
- 10. What is the required insulation temperature rating for branch-circuit conductors near a ballast?**
- A. 70 degrees Celsius**
 - B. 80 degrees Celsius**
 - C. 90 degrees Celsius**
 - D. 100 degrees Celsius**

Answers

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- 1. A**
- 2. B**
- 3. C**
- 4. B**
- 5. C**
- 6. B**
- 7. B**
- 8. B**
- 9. B**
- 10. C**

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Explanations

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1. According to NEC code, how many receptacles are allowed in a kitchen area for small appliances?

- A. Two receptacles**
- B. Three receptacles**
- C. Four receptacles**
- D. Five receptacles**

The National Electrical Code (NEC) specifies that in kitchen areas, there should be a minimum of two 20-ampere small appliance circuits provided for the receptacles that serve countertop surfaces. This requirement ensures that there are enough circuits to handle the load of common kitchen appliances such as toasters, blenders, and coffee makers without overloading the circuit. While there can be more receptacles installed, as long as they remain on these dedicated circuits, the specified minimum is two. This is to allow for convenience and efficiency in using multiple appliances simultaneously while adhering to safety standards. Having just one receptacle may not accommodate multiple appliances that are often used at the same time in kitchen settings. This is an important consideration for kitchen design and electrical safety, which is why the NEC sets this standard in residential wiring guidelines. In practice, electricians may choose to install additional receptacles for enhanced functionality, but the foundational requirement is two, which aligns with the answer provided.

2. What is the minimum height for a service drop above a residential driveway?

- A. 10 feet**
- B. 12 feet**
- C. 14 feet**
- D. 8 feet**

The minimum height for a service drop above a residential driveway is set at 12 feet. This requirement is in place to ensure adequate clearance for vehicles that may be traveling underneath the power lines, reducing the risk of contact. Having a clearance of 12 feet helps protect both the electrical infrastructure and the vehicles using the driveway, minimizing potential accidents or damage. Establishing this height standard is crucial for safety regulations outlined in the National Electrical Code (NEC) and local amendments, promoting safe distances between electrical conductors and vehicular traffic areas.

3. What is the function of a ground fault circuit interrupter (GFCI)?

- A. To switch circuits on and off**
- B. To prevent electrical fires**
- C. To cut power when it detects a fault**
- D. To monitor electrical load**

The ground fault circuit interrupter (GFCI) is specifically designed to enhance safety in electrical systems by cutting off power when it detects an imbalance in the electrical current. This imbalance typically indicates that some of the current is finding an unintended path to ground, which may occur in situations like a person accidentally touching a live wire or a faulty appliance. The GFCI continuously monitors the incoming and outgoing current and can react within milliseconds to stop the flow of electricity, thereby reducing the risk of electric shock and potentially preventing severe injury or fatality. This protective function is crucial in wet areas such as kitchens, bathrooms, and outdoor settings where the risk of shock is heightened. It is distinct from devices that merely switch circuits on and off, prevent electrical fires through circuit protection, or monitor load, each of which serves different safety and operational purposes in electrical systems.

4. How often is the National Electrical Code updated?

- A. Every two years**
- B. Every three years**
- C. Every four years**
- D. Every five years**

The National Electrical Code (NEC) is updated every three years. This schedule allows for regular review and incorporation of new technologies, practices, and safety measures related to electrical systems and installations. The NEC is developed by the National Fire Protection Association (NFPA), and the three-year cycle ensures that the regulations stay current and relevant to the evolving electrical industry. Regular updates also allow for input from industry stakeholders, ensuring a collaborative approach to safety and effectiveness. This helps electricians and professionals maintain compliance with the latest standards and best practices in their work.

5. What is the minimum size copper wire allowed for residential branch circuits in Colorado?

- A. 16 AWG**
- B. 12 AWG**
- C. 14 AWG**
- D. 10 AWG**

The minimum size copper wire allowed for residential branch circuits in Colorado is 14 AWG. This wire size is typically adequate for the ampacity requirements of general lighting and receptacle circuits in residential settings, which are commonly rated for 15 amps. Using 14 AWG wire ensures that the circuit can handle the typical load demands without overheating, while also allowing for safe and efficient operation under normal conditions. In residential installations, electrical codes and regulations mandate specific wire sizes based on the expected load and ampacity. Choosing 14 AWG is consistent with the National Electrical Code (NEC) guidelines, which stipulate that this wire size is suitable for most residential branch circuit applications, hence ensuring safety and compliance. It is important to note that larger wire sizes, like 12 AWG or 10 AWG, while they are suitable for higher ampacity circuits, are not required for standard residential lighting and outlet circuits.

6. What is the purpose of using multi-wire branch circuits?

- A. To reduce installation costs**
- B. To allow for a single circuit to supply multiple voltages**
- C. To provide flexibility for future expansions**
- D. To distribute power more evenly across circuits**

The correct understanding of the purpose of multi-wire branch circuits centers around the concept of supplying multiple voltages from a single circuit. Multi-wire branch circuits can use two hot conductors from different phases of a power supply, allowing them to deliver different voltage levels depending on the configuration. This approach is particularly beneficial in residential and commercial settings where varying voltage requirements are common for different types of equipment. By utilizing multi-wire branch circuits, electricians can efficiently supply both 120V and 240V outlets from the same circuit, reducing the need for multiple separated circuits for different voltage levels. This configuration not only conserves conductor materials—since fewer wires are needed overall—but it also optimizes panel space and simplifies the electrical installation. Hence, it makes perfect sense that the correct option highlights this critical aspect of multi-wire branch circuits in terms of voltage supply capabilities.

7. What is the definition of a "lighting outlet" in NEC terms?

- A. An outlet intended for electrical appliances**
- B. An outlet intended for the direct connection of a lighting fixture**
- C. An outlet used for outdoor lighting**
- D. An outlet reserved for emergency lighting**

A "lighting outlet," according to the National Electrical Code (NEC), is specifically defined as an outlet that is designed for the direct connection of a lighting fixture. This definition emphasizes the primary function of the outlet, which is to provide power to fixtures meant for illuminating a space. In a practical sense, this means that lighting outlets are typically where light fixtures, such as chandeliers, ceiling lights, or wall sconces, are connected directly to the electrical supply. This distinguishes them from other types of outlets that may cater to different electrical needs, such as powering appliances or providing power for outdoor lighting installations. Understanding the specific purpose of lighting outlets is crucial for compliance with electrical safety standards and ensuring proper installation practices. This helps prevent issues like overheating or improper load distribution that could arise from misusing outlets meant for different purposes.

8. What does the term "ampacity" refer to?

- A. The total electrical energy consumed**
- B. The maximum amount of electric current a conductor or device can carry before sustaining immediate or progressive deterioration**
- C. The resistance of a conductor**
- D. The voltage level in an electrical circuit**

Ampacity refers to the maximum amount of electric current a conductor or device can carry without leading to immediate or progressive deterioration. This is a critical factor in electrical design and safety, as exceeding the ampacity of a wire can cause overheating, insulation breakdown, and potential fire hazards. Understanding ampacity helps electricians select appropriate wire sizes and materials for specific applications, ensuring safety and functionality in electrical systems. The term emphasizes the importance of current-carrying capacity in maintaining the integrity and longevity of electrical components.

9. What kind of protection is required between conductors and armor in armored cable?

- A. Heat-shrink tubing**
- B. Insulating bushing**
- C. Electrical tape**
- D. Plastic conduit**

The requirement for an insulating bushing between conductors and the armor in armored cable is primarily to provide a barrier that prevents potential electrical shorts or damage to the conductors. Armored cable, while offering physical protection, can be abrasive to the insulation of the individual conductors it contains. An insulating bushing serves to shield the conductors from the metal armor, ensuring that the insulation does not wear away due to contact with sharp edges or movement. This practice is crucial for maintaining the integrity of the electrical system and to comply with safety codes. Proper insulation helps to avoid failures that could lead to short circuits or even fire hazards. While other methods, like heat-shrink tubing or electrical tape, might provide some level of protection, they do not fulfill the specific code requirements outlined for armored cables as effectively as an insulating bushing does. Thus, using an insulating bushing ensures compliance with safety standards and prolongs the life of the cable installation.

10. What is the required insulation temperature rating for branch-circuit conductors near a ballast?

- A. 70 degrees Celsius**
- B. 80 degrees Celsius**
- C. 90 degrees Celsius**
- D. 100 degrees Celsius**

The required insulation temperature rating for branch-circuit conductors near a ballast is 90 degrees Celsius. This rating is essential because ballasts can generate significant heat during operation, and the conductors must be able to withstand these elevated temperatures without degrading. Using conductors with an adequate temperature rating ensures safety and reliability in the electrical system, as it minimizes the risk of insulation breakdown, which could lead to short circuits or electrical fires. In environments where high temperatures are generated, conductors rated for higher temperatures provide the necessary durability and performance to operate effectively in close proximity to heat sources like ballasts. This understanding is critical for electricians and professionals in the field, emphasizing the importance of selecting conductors with the proper insulation rating to maintain the integrity of the electrical installation and comply with safety standards.